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A REPORT
—ON—
ELEMENTARY TECHNICAL
EDUCATION
—FOR—
ONTARIO

—BY—
W. S. ELLIS,
PRINCIPAL OF KINGSTON COLLEGIATE INSTITUTE.

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A Report Regarding a Course of Study of a Technical Character for Public and High Schools.

Explanatory.

Throughout this report the term **ELEMENTARY TECHNICAL COURSE** will mean a course of study that is first of all educational, but will at the same time tend to fit pupils, both by information acquired and training given, for the practical side of life's duties, whether the student is intending to adopt a professional, a mechanical or a commercial pursuit. The name is chosen, for want of a better one (though open to objection), to distinguish such a course from the merely academic studies which lead, in public schools to the Entrance, and in high schools to Departmental Matriculation and Leaving examinations.

Introductory.

There is a somewhat vain-glorious assertion often heard from press and platform to the effect that Ontario has the best educational system in the world. People who indulge in these idle boasts are seldom qualified either to judge of educational affairs or to observe elementary facts, else they would know that the best for Ontario could not possibly be the best for Switzerland, Sweden or Japan. Varying conditions make comparisons impossible.

The question of whether or not we have the best system in the world is not worth a moment's thought, and any discussion about it is entirely futile. That such a boast is heard at all just indicates that the dry rot of contentedness is getting a foothold, and that measures for its dislodgement have become necessary.

The real problem seems to be, — Have we that system which, in design and administration, is best suited to give our people the greatest measure of material and intellectual prosperity that by temperament and position they

are capable of reaching? Have we read aright the significance of the great world movements of our times, and have we made such adaptations educationally, as will fit the school population of our own generation and their successors to meet the changing conditions with a fair prospect of success? On the other hand, have we allowed ourselves to be betrayed into thinking that drift means advancement, that agitation is progress, and that pother about trifles, such as the adjustment of examination marks, is educational growth?

Whether or not our system is adequately meeting the requirements of the Province can be determined only by considering (1) the objects which the schools are attempting to accomplish, (2) the conditions that prevail in the country.

What the Schools are Doing.

Our schools are attempting to do three things, somewhat related it is true, yet aiming at three distinct ends, for each may exist apart from the others.

First.—There is the effort to train the mental faculties,—to cause the child to grow intellectually. For this purpose we spend much time and energy on subjects of a purely disciplinary character. This is *education* in its technical sense, and as the term is used in theoretical discussions. Without doubt this mental discipline should be the primary object of every system of education. The ability to think clearly, to judge correctly, and to act independently forms the basis of all progress, but the power to perform these functions comes only after long training, whether that training be got within the school or without.

The second aim is to furnish the student with certain information which it is deemed advisable for every one to be possessed of. There is a great and persistent danger that this second end, instead of being incidental to the first, and to some extent perhaps supplementary to it, may become the chief aim of school life. This is especially the case when an examination result becomes the test of educational efficiency. "Idolatry of knowledge," and that knowledge fragmentary and useless, may lead to displacement of the less showy and less easily tested dis-

cipline of the mind, which is intellectual strength and stability. That such a displacement is possible should make us guarded that the knowledge imparted will be useful, and that the process be not simply a time wasting one.

The third aim is to give the students some special training for the employments they may have to follow in later life. This consists, in part, of gaining facility in certain mechanical operations, and in part, of acquiring knowledge of the details of some methods used mostly in commercial operations.

Subjects on Curriculum Because of Their Usefulness.

Whatever opinion may be held about the functions of schools that are wholly public institutions, we actually have them performing the threefold duty just described, viz.—: Giving pupils an education, giving them learning, within certain limits, and giving them training for practical employments. This is not the place to discuss the wisdom of such an arrangement of educational work, but to emphasize the statement of fact that it is now, and has been for some time, in actual existence in our own schools.

It is desirable at the same time to have in mind that those subjects which we now keep on our curriculum because of the intellectual discipline that their study affords were inherited by us from the programmes of older schools, and that in those schools these subjects were selected for study because of their *usefulness* in the after life of the student.

In our day their existence is a survival, but with altered functions, from an earlier period and other conditions. The differentiation of studies into classes is one result of the more scientific treatment of education within the present generation. In the earlier and more formative period of schools and their systems, the introduction and position of subjects of study were determined by their probable value to the student in his manhood,—that is, by the application he could make of the knowledge he acquired, not by the intellectual discipline he gained from them.

Tendency of the Present Course of Study.

It seems scarcely open to question that the school life of the child should be a fitting for the mature life of the adult in its completeness. It follows from this that a broad and liberal school curriculum should make provision for giving students some preparation for entering the great industrial occupations of the country, so far as can be done without sacrificing educational efficiency. This does not mean the establishment of trade schools in any sense of the term, but it does mean the providing of such a course of study in the primary and secondary schools as will afford boys and girls an opportunity to fit themselves for intelligently taking part in commercial and manufacturing life, just as the present course fits them for professional callings. It is a reproach to the system as we now have it, that its tendency is to turn the minds of pupils entirely towards the professions and away from the industrial pursuits. Probably nine-tenths of the public school teaching of Ontario has for its object the passing of pupils through the entrance examination, and certainly nine-tenths of the high school work aims only at the Departmental examinations, which are practically those for University matriculation; thus it comes about that at the end of school life the student has had the mental discipline of the course, which is entirely desirable; but the choice of studies and the methods pursued have given him very little acquaintance with the practical affairs of the world, neither has he gained mechanical facility nor useful information, even about current events. The life of the school and the life of the world outside have been two distinct existences scarcely even in contact with each other.

Some Conditions for Consideration.

We are living in a new country with great districts undeveloped and almost unexplored, acknowledged on all hands to be enormously rich in mineral resources which are just beginning to be opened up and for the development of these skilled and educated men are a necessity.

Our own province and those westward of it have agricultural possibilities, that are hardly yet realized, which

with intelligent management should place the material prosperity of the country beyond question.

In a single district of northern Ontario there is power enough going to waste to drive the entire machinery of the continent, yet rivers and waterfalls still lie in the unbroken wilderness.

A considerable portion of the capital wealth of Canada has been, and is, in its forest products, yet year by year these are being used up and the resources of the country thus reduced, with no adequate steps toward the nurture and replacement of raw material. There is room and need here for a whole department staff of trained men.

Within twenty years there has been a complete revolution in the agricultural products, methods and exports of the province, and the adaptations to the new requirements are being made only after slow and costly experiments. Now reliable experiments necessitate trained observers, and these are not a natural farm product of this land.

A similar consideration of great importance is the changed industrial and commercial conditions within the generation just past. Those of us who are yet at middle life have seen the skilled workman forced into the labourer's position, and the apprentice disappear from the trades. Formerly, by country crossroads and village street the woodworker and the blacksmith made the carriages and farm implements for the neighbourhood; now the woodworker has practically passed off the stage and only an odd blacksmith lingers to nail on the horse-shoes that are dropforged in the city mill, and to repair the carriages and farm machines that are built in the city factory. Similarly the shoemaker has been driven from his bench, the tailor from his counter, the cabinet-maker from his shop, so that except in the building trades, there are but few skilled workmen whom stress of competition has not forced to give up their business; and never again will the tradesman or the apprentice cut any figure in the economic history of the world. No longer can the energy of human muscle compete with that of the steam engine and the turbine. Invention of machinery that replaces hand labour, and improved means of transportation have produced those concentra-

tions of effort and divisions of labour which the modern manufactory has made us familiar with.

While this drift and readjustment of industrial operations and trade centres have practically driven out the skilled artizan of former years, they have equally created a demand for a new class of workmen, the basis for whose preparation must be laid in the schools, not in the shop. The call is for men of intelligence, educated and trained, with ability to grasp the ideas of the guiding head of the department and translate them into finished products. This is not the man at the machine in the modern factory who, without early training and education and without the energy and ambition to gain these in later life, is likely to become as little intelligent, as little useful and as little human as that hypothetical personage with the hoe. But the man who goes in, educated to do independent thinking, trained to work quickly and accurately, and capable of gaining knowledge of men, materials and machinery, will be in demand so long as present manufacturing conditions continue.

If students have not the means of fitting themselves for such occupations as the needs of the country and the needs of industry require, they will doubtless still continue to go to school and college, and become lawyers, doctors, preachers and teachers, though they may have little mental aptitude for these professions, and though continually faced by the puzzling question of finding a location in which another of their class can earn a living.

Two Educational Factors of the Problem.

In the city of Kingston, with a fairly constant school attendance, from 40 to 45 per cent. of the pupils enrolled in the junior third book never finish the senior fourth class. As the causes that produce this result are common to all the large centres of population it is likely that all have somewhat similar experiences with their higher classes in public schools.

When looking for the reasons for this serious state of things, the enquirer is constantly met with the statement "These boys and girls have to make their own way in life, and they cannot afford to *lose a year or two* in studying subjects that are of no use to them." There are two

regrettable conditions existent here, (1) that a large number of children of immature age are turned out into the world with the apology for an education which they have received up to about the senior third class, (2) that the school work in the senior classes does not appeal to the parents of these children as being of value to them in their struggle for success in the battle of life.

Without giving endorsement to the contentions of these people, it may just be pointed out that the position they take is not altogether an unreasonable one. A pupil who does not intend to go through the high school either for matriculation or for a teacher's certificate is at a disadvantage educationally, and his time is not on the whole well employed, either in the senior classes of the public school or in the high school. This is part of the toll we pay for our foolish plan of judging school success by examination results. It is at least unfortunate that in our schools we have this constant rush for certificates, but scarcely a candidate for an education. Confidence in the system cannot be restored by persistence in the course that led to the evil.

Then of the scholars in the high schools 30 per cent. of those who enter the first form never go on to the second, and of those who do enter the second form 25 per cent. drop out before they get into the third form, that is, a year at least before they complete any high school course. This may be expressed in another way, as follows:—About 45 per cent. of the scholars who enter the high schools leave without finishing any course of study; thus as a fitting for the duties of life, they have had a year or two in school with a class preparing for matriculation or for teachers' certificates.

Under the circumstances the following enquiries seem to be pertinent:—(1) Is the study and the drill required for the Entrance Examination a proper and serviceable course for pupils who will not use the standing thus obtained, but who desire an education that will fit them best for engaging in the active and practical affairs of life? (2) Have not these scholars in the public schools, together with the forty-five per cent. of the pupils who enter the high schools and leave before finishing any course, quite as good a claim to an educa-

tional curriculum suited to the needs of their future lives as have the balance of the high school pupils who are preparing for their professions?

If such a course were available and properly taught there would be hope of a considerable rise in the educational status of the province; because of a larger number of pupils taking advantage of the altered, and for them more favorable, school conditions to remain longer in attendance.

The second factor may be stated this way:—That there is a demand for a useful preparation for mechanical and industrial pursuits is shown by the fact that one correspondence school in the United States, which professes to give instruction by letter to fit students for mechanical and engineering employments, had enrolled in April last 180,000 students; and the number has now doubtless reached 200,000. Of these it is asserted by the officers of the school, and there is no reason to doubt the correctness of the statement, 20,000 are in Canada. Three hundred of them are announced to be in Kingston and its neighborhood. This means that the correspondence school in the United States has five-sixths as many students as the Collegiate Institute in the city, and at a fee from four to six times as great as the local one. These are generally ambitious and intelligent young men, who recognize that they must get knowledge and training to rise in their chosen pursuits. It is hardly likely that students of the class who are earning their money would be willing to pay the relatively high fee for explanation by letter, if they could have the advantage of personal teaching from competent masters, in class-rooms properly equipped with suitable apparatus. We are nominally teaching science, mathematics and mechanics now in our schools; but we have made that work entirely subservient to the demands of the junior lecturers in the universities, instead of meeting the needs of the people for whom the system exists, in theory at least.

The Home-making Element.

The great majority of the boys and girls of Ontario are, in the natural course of events, to become the country's home-makers within the next few years. If

the object of education is to develop the faculties for right and complete living (not mere existence), surely the *living* requires quite as much attention as the *right* and *complete* part of the duty.

A boy or girl who passes through the public and high school comes out at the age of 17 or 18 without either knowledge or training that is of any real value for securing domestic comfort or enjoyment. It has apparently come to be a strict law with us (unwritten it is true, but the more unbreakable on that account) that every pupil in our schools shall have a course of academic education ; but under no conditions shall anything of a domestic nature be taught. Considering the circumstances of the country and of the people at large, it would seem far more reasonable to reverse the law and make it read "Every pupil in school shall learn about the duties and requirements of home-keeping, and every girl shall go farther and become acquainted with those domestic affairs relating to the household which it is reasonable to suppose she will have to either perform or oversee in her own home at a later period." Herbert Spencer's jibe at the English schools of twenty years ago, as those of a nation of celibates applies equally to our own of to-day ; with the addition that the people who had such a system and such schools were evidently cave dwellers.

Elementary Technical Course.

Such a course should be educational, that is the work assigned in the various subjects should afford a good discipline for the mental faculties and should compel the student to practice logical thinking. It should equip the student with that knowledge which is requisite as a foundation for the practical work of life of a mechanical or commercial nature. It should particularly give plenty of practice in observing, in accurate reasoning, and in training of the hand.

The introduction of such a course would not involve any new principle in school work ; for, as has been shown, our schools are already attempting, though in a somewhat hap-hazard and luckless way to accomplish the same three things. The reasons why the present course fails of these results seem to be these :—(1) The curricu-

lum is loaded up on its purely educational side with subjects that are not accompanied by either useful information or training. (2) The knowledge gained by the student is not of a character that can be applied in the callings of life, nor has it been got for that purpose at all, but rather to enable the student to make marks enough on an examiner's paper to obtain a certificate; and even of that the minimum required measures the maximum of the student's efforts. (3) The training now given as a foundation for any future occupation, is trifling in amount and often worse than trifling in methods.

The full requirements would be met by a course made up of **ENGLISH**, including Grammar, Composition, Literature, History, and Geography. **SCIENCE**, composed of Botany, Physics, Chemistry, Zoology, Mechanics, Geology and Mineralogy. **MATHEMATICS**. **MANUAL TRAINING** including **DOMESTIC SCIENCE**.

Details of the Course.

ENGLISH.

Grammar and Composition, as practically applied in speaking and writing, and to such an extent that the student will habitually speak correctly, and that he may be able to write a letter or report in plain intelligible language with an effective arrangement of the parts.

Literature.—A course of reading of good English authors for the purposes of forming a taste for such literature, learning to read intelligently, gaining useful information, and obtaining a vocabulary. With this should go practice in oral reading, practice in oral expression of ideas before a class, and a course of supplementary reading in History, Scientific books and current news.

History.—A study of the industrial, commercial, territorial and legislative growth of the British Empire during the present century, with a brief reference to the great events in the development of the empire during former periods such as the Elizabethan voyages, Walpole's administration, the American colonies, &c. A study of the history of the various Canadian provinces since 1800, with sketches of preceding important events. Rights and duties of citizenship.

Geography.—Study of a globe, position of continents,

oceans, routes of travel, important lines. Maps; physical features of the continents, as related to mountains, watersheds, drainage areas; climatic conditions as to their cause and effect upon products and people; manufacturing and commercial centres. Exports and imports of the chief countries, inter-imperial trade. The study of the provinces of Canada in detail, productions as related to climate, rocks, soil, &c. Chief rock formations and accompanying minerals, forests, water supply. Elementary Geology and Physiography.

SCIENCE.

Botany.—The practical study of plants both wild and cultivated, conditions of growth and methods of propagation. Diseases and enemies of farm and garden plants, and methods of treatment.

Physics.—An acquaintance with those laws of matter that underlie the structure and use of ordinary machines. Properties of solids, liquids and gases. A brief course covering the essential practical principles of Heat and Electricity.

Additional for boys—The necessary theorems of statics, hydrostatics, mechanics, dynamics with applications. Structure and use of the turbine, steam-engine and dynamo, Methods of transmitting and transforming energy.

Chemistry.—A study of the common elements and the simpler portions of chemical theory. Practical work with the metals and their compounds illustrating methods in chemistry.

Additional for girls—A study of common household materials and operations, such as baking powders and baking, soaps and washing, waters, disinfectants, and detection of common impurities.

Zoology.—Study of types of the great classes of the animal kingdom, their gross anatomy, circulatory, respiratory, nervous and digestive systems. Entomology, chiefly economic.

MATHEMATICS.

Arithmetic.—Simple rules and common commercial work with quickness and accuracy.

For boys.—Calculation of quantities and materials, as required in contractors' and manufacturing work.

Algebra.—Through quadratics as used in mechanical and physical problems.

Geometry, (not Euclid).—Study of the straight line, rectilinear figures, circle, parallelopipeds, sphere, prism, cone, pyramids, with the mensuration deduced therefrom.

Trigonometry.—For boys.—Through solution of triangles as used in physical and mechanical work.

FRENCH AND GERMAN.

As optional subjects, so far as to leave the student able to read the language with facility. This especially for those who wish to engage in engineering or scientific pursuits, that they may become acquainted at first hand with current literature.

MANUAL TRAINING.

As this department of work is but little known in Ontario a paragraph may be devoted to it. Let it be stated once for all that the object of manual training is not to turn students into mechanics. It no more follows that a boy is to be a carpenter or a machinist because he uses a plane or calipers than that he is to be an editor because he uses a pen, or an artist because he has spoiled some drawing books.

In Great Britian, on the continent Europe and in some American cities there are Trade Schools and Manual Training Schools. The object of the former is to teach the pupils some particular trade, as watchmaking : while that of the latter is to teach the use of tools and processes of working, in order that trades may be more easily learned or employments found afterwards. These are referred to lest some one not familiar with this subject might make the mistake of supposing that their methods and aims are similiar to those of a mannual training department of a technical course.

In the system here advocated Mannual Training is one of four departments, all about equally important as regards time given to them, and results anticipated from them. The Mannual Training is insisted on (1) because of its educational value in developing the think-

ing and reasoning powers of the student ; (2) because knowledge acquired from it and the experience gained can be practically applied in most occupations in which men engage ; (3) because it exercises and develops powers both of mind and body that the ordinary school curriculum leaves dormant.

A suitable course of study would be as follows :—

(1)

For Boys.

For Girls.

Kindergarten work.

Moulding in clay.

Cutting paper and card-boards to pattern and forming objects of it.

Cutting colored papers and joining them to form ornamental patterns.

Freehand Drawing.

Same for girls.

(2)

Work in card-board as a preparation for wood-working exercises.

Chip carving with knives and drawing of simple designs.

Same for girls.

Needle work.

(3)

Bench work with simple carpenters' and joiners' tools. Cutting to line. Truing up and joining parts to make finished objects, such as stools, cabinets, bookracks, all from scale drawings.

Freehand drawing and carving.

Same for girls, but with more attention to wood carving and freehand drawing.

(4)

Bench work in wood of more variety, introducing turning, boring, dovetailing, &c.

Freehand drawing of ornamental patterns.
Wood carving, Venetian metal work.

For Boys.

Drawing, freehand, mechanical, architectural.

Machine shop exercises in metal with lathes, planer, drills, &c.
Bench work in metals, chipping, filing, fitting.
Drawing, mechanical and architectural.

Pattern-making, moulding, and casting of small objects.
Light forge work on small articles, both useful and ornamental, to afford practice in methods of treatment.

For Girls.

Sewing by hand and machine.

Cooking of simple dishes, such as crushed cereals, farinas, eggs, potatoes.

(5)
Ornamental and industrial designs in pencil, water color, and stencil work.
Cooking of vegetables, breads, meats, pastry.
Serving of foods and arrangement of dining room
Dressmaking, measuring, drafting, cutting and making plain garments of light material, such as blouses and skirts of cotton and linen.
Simple millinery consisting of the choice of materials, and the use of them in trimming hats.
Lessons on materials, colors and texture of dress goods and trimmings.

(6)
Cooking for invalids and children.
Dressmaking from heavy materials.
Millinery, — the making and trimming of hats and bonnets.
Home nursing, emergency treatment of illness and injuries, administering of food and medicine, changing of patient's clothing.

For Boys.

For Girls.

Theory and practice in household cleansing, laundry work, disinfecting and similar operations.

Marketing for a household.

To some this may read like a rather ambitious programme of work, and it is fairly complete, but not more so than is being systematically carried out in many American schools, and those not in the largest cities either.

Why Manual Training is Desirable.

All minds are not constituted in the same way, consequently are not capable of equal improvement by the same subjects and methods of teaching. So long as we have to deal with different mental attitudes and strengths we require different methods of treatment and problems of various kinds to get the best results for all. There seems to be no good reason, except conservatism and prejudice are to be ranked as such, why the concrete and practical problems of actual life should not be turned to account for mental training, as well as the theoretical and the abstract of the schools. Especially so when it is kept in view that for many minds, perhaps the majority, the mere theoretical and abstract offer conditions that are difficult to understand, hence are not educational because not clearly intelligible. It does not seem desirable therefore that all students, regardless of natural powers and aptitudes, should be compelled to work along exactly the same lines. This has been acknowledged in high school work by permitting some options. By using these and the honor courses high schools are able to give some special attention, very near the end of their studies, to students who promise to distinguish themselves along some line in their university career.

But nowhere is there any provision made, or any encouragement given to the student whose mind has a practical bent, or who is likely to gain distinction, either in applied science or in mechanical work. This purpose Manual Training fulfils.

The mechanical problems of the workshop, the cooking table and the drafting room, when used by a competent teacher, afford a means of mental discipline not at all inferior to that of the ordinary class-room work,—indeed to the majority of students they would be valuable because they occur in practice and have a reality that the others lack. Since the widest discipline is sought, proper provision should be made in school to meet the needs of those who do not profit by the study of abstract mathematics or of foreign languages. Also Manual Training insists on a nicety of judgment, an accuracy of observation, an attention to details, and a carefulness in manipulation which one can bring out no place else in the school curriculum; and such habits when once developed will react on other work.

It affords valuable training for hand and eye. The ability to control these organs and to have them act in obedience to the will is always a desirable power, and the possession of it, both in professions and ordinary employments, often distinguishes the expert from the mediocre. Still, the only attempt made in school to give pupils this valuable acquisition is the little bit of free-hand drawing in the course.

It tends to save the waste of human faculties. "There is no more familiar fact nor one which suggests more pathetic reflection than the large store of unused capacity in the world. Hundreds of men and thousands of women carry down with them to their graves great gifts which are well-nigh wasted, powers of usefulness unsuspected by the world, and hardly known to their possessors, because the right means for development have not been supplied and opportunity has been wanting." (Fitch.) Manual Training by greatly increasing the opportunity for development of pupils' capacities tends in like proportion to check this human waste and to turn it into productive channels.

A Word of Warning.

The success of manual training work, as an educative agency, depends quite as much on the teacher as does that of any other department in school. A mere mechanic or cook, no matter how skilful, who simply shows students how to perform certain operations, will accom-

plish nothing useful. In order that the best results may be obtained, the department must be in charge of a thorough teacher who is also an expert workman ; so that in addition to illustrating the various processes, he may train the observation, the reasoning power, and the other mental faculties of the students. The mere learning of methods of doing avails nothing ; it characterizes the tradesman's shop and the apprentice, not the school room and the pupil. In consequence of this the exercises are chosen for their educational value ; and their use to the mechanic is entirely a secondary consideration. So the teacher, rather than the workman, must be the chief influence in the school workshop.

The Example of Other Countries.

In Great Britain, Russia, Austria, Switzerland, France, Germany, Belgium, Denmark, Sweden and the United States, schools giving a practical education, including Manual Training and Domestic Science, have had much attention from educationists within the last few years, while they have been increasing immensely in numbers. As a general thing the courses of instruction and the methods of European schools are not suited to Ontario requirements. We may learn from them, profit sometimes from their experience and mistakes, may indeed copy from them in parts, but may not imitate them. The differing conditions of the countries, and characteristics of the people would make certain failure follow such a proceeding. The American schools have learned this lesson sometimes by costly experience, so that their work and methods are generally very largely of their own devising, hence are more nearly suited to our needs. Whatever the differences may be, however, there is no country in which these schools have been established that they have been abandoned : on the contrary they have in all cases steadily advanced. Mistakes have been made, enthusiasts have gone wild in their foolish efforts to turn all education in this direction, still the schools have grown in numbers and in influence.

In explanation of the scope, methods and equipment of typical American Schools, devoted to elementary technical work, the following extracts are taken from a report of a visit made to a number of them, at the in-

stance of the Kingston Board of Education, for the purpose of gaining information about them that would be of service for the establishment of such a school here.

GENTLEMEN :—As instructed by you at the last meeting of this board, I have visited schools in a number of American cities with a view to becoming acquainted with the courses of study and the methods adopted for securing practical education in the secondary schools of the Eastern States.

I did not think it wise to spend any portion of the short time I could stay away at this period of the year in going to inferior schools ; I therefore tried to go to those which, so far as I could learn, were typical of the best, both in staff, methods and equipment, in the kind of work that we are proposing to carry on.

The following were the schools visited :

The Boys' High School of New York city.

The high school of East Orange, N. j.

The Pratt institute, of Brooklyn.

The Teachers' College,—a department of Columbia University,—in New York city.

The Boardman Manual Training School of New Haven.

The Mechanic Arts High School of Boston.

The Rindge Manual Training School of Cambridge.

In preparing this report I have followed this plan :

1. To briefly describe the various institutions, their work and aims.
2. To summarize the results of my observations and the information I gathered from the various masters with whom I discussed educational matters.
3. To indicate some conclusions that I think may fairly be drawn, and that relate to school affairs.
4. To outline a course of study and mechanical work that seems suitable for training for boys in this country.
5. To outline a similar course for girls.

Description of Schools.

THE BOYS' HIGH SCHOOL OF NEW YORK.

This may be passed here with the remark that there in no Manual Training yet introduced into the high

schools of the city, although it has a place in the grammar schools. Measures are being taken, however, for the establishment of a technical high school in the near future.

HIGH SCHOOL, EAST ORANGE, NEW JERSEY.

East Orange is a New Jersey city of about 20,000 inhabitants, and is mostly a place of suburban residence for New York business people. The high school has an attendance of 350, and is therefore somewhat similar to our own in the number of scholars and in the constituency from which support is received. For these 350 scholars there are twenty-three teachers,—twenty-one on permanent staff and two special ones; of the twenty-three, twenty-one are women. The manual training in this school is made up,—for boys, of mechanical drawing and wood work, nearly altogether carving, as the joinery is done in the grammar school grades, before entering the high school; for girls there is free hand drawing, leading up to decorative designing of various kinds, sewing, simple dress-making and millinery, and wood carving.

As I intend to deal with girls' work in one place at a later stage, I merely mention its character under the various schools.

The manual training is optional for all students, but not compulsory upon any. I was told by the teachers that about seventy per cent. of those entering take this work in the first year, this decreases to about twenty-five per cent. by the third year, and in the fourth year of the course it is not taken by any. This result, it seems to me, is sufficiently explained by the facts that manual training is handicapped by not counting, in any way, toward the standing or record of a student in the school; that the course is limited in extent, consequently does not permit of much new work being taken up; that the department is in charge of a lady as teacher, who gets excellent results in drawing and carving, but has not facilities for doing much in other kinds of work.

On account of previous training the boys are able to make, with neatness, such objects as a box, a wall bracket, a small cabinet, a bookcase, etc. In the high school they put in regularly two hours a week in the shop and drawing room, at such periods as they are free

from other classes; and occasionally extra time after regular school hours.

The architectural drawing was, in my opinion, very good, and was an important educational subject, because it furnished many a problem for solution to the boys engaged at it, as anyone will easily understand who has attempted to work out the floor plans of a house. Several boys were engaged on plans of buildings designed by themselves. They were working out floor plans, and elevations with details of heating, drainage, stairways, cornices, frames, etc. Others were busy making drawings of pieces of machinery, all according to conventional methods, so that a workman might take the sketch and construct the piece from it. Manual training is comparatively a new department in this school, introduced, I think, about five years ago.

PRATT INSTITUTE, BROOKLYN.

This institute was founded some thirteen years ago by Charles Pratt, of Brooklyn. The object aimed at in all its work is, according to the founder's direction, "The promotion of manual and industrial education, as well as cultivation in literature, science and art, the fostering of habits of industry and thrift and all that makes for right living and good citizenship." This sentence, it seems to me, would serve admirably as the creed for the new phase of education with which this report is dealing. The experiment has worked out in the direction of establishing a complete educational institution, with classes from the kindergarten through public school, grammar school, high school and technological work, and a training department for teachers. There is, in addition, a great deal of instruction in evening classes for those who desire special preparation for particular occupations. This form of help really is a school of trades. Classes are formed for blacksmiths' apprentices, plumbers' helpers, house painters, carpenters and joiners, and many other of the common trades, for the purpose of giving an intelligent understanding of the materials and processes employed. There is another department devoted entirely to art work; it, of course, is largely patronized by girls. One of its chief aims is to

make students acquainted with the principles that underlie ornamental and artistic work as applied to industrial pursuits and home decoration.

The provision for manual training is exceptionally complete and, I think, typical of the best to be found. In the high school course manual training occupies about one-fifth of the time for four years. The purpose, with students of this grade, is entirely educational, to develop and cultivate hand and eye, as well as the purely mental faculties. For this reason the work at bench and drawing table is carefully correlated to that in the other class rooms, so that no one department causes excessive drain either upon time or mental powers of the student. Boys and girls work together in the woodworking shops during the first year, after this they separate, the boys taking lathe work in wood and metal, vise and bench work, pattern making, moulding, forging and machine construction, and their drawing is confined to the mechanical work altogether. The workshops are equipped with complete sets of machines and tools as required for each of twenty-five students in a class. The work is done under the supervision of an instructor. In the wood-working department the exercises are somewhat remotely founded on the Sloyd of the European countries, but with great modifications, especially in two directions, viz., the omission of exercises that involve repetitions and the making of completed articles rather than of a single part.

During the first year the drawing is freehand and instrumental. The manual training is bench work in wood, using common simple tools, making easily constructed articles that permit of typical exercises valuable for hand and eye training. Wood carving.

During the second year the drawing is freehand and instrumental, designing patterns and ornaments; manual training for boys is wood turning, pattern making and moulding in foundry; for girls is sewing, drafting, cutting, making simple garments and study of materials.

Third year, for girls is drawing, color work design; for boys, mechanical drawing. Manual training for boys is forging, blacksmithing, decorative iron work; for girls is dressmaking and millinery.

Fourth year, for girls, color work, cast drawing and composition; for boys, mechanical drawing. Manual training, for boys, machine shop work and machine tools; for girls, domestic science, cooking and home nursing.

The mathematics of the course runs through the whole four years, if desired, but for those who wish a training in languages, either French, German or Latin may be substituted in third and fourth years.

The full course is :

Language, four years ; English, with French, German or Latin, if desired as additional subjects replacing Mathematics for the last two years, four hours a week.

History and civil government, four years, two or four hours a week.

Music (singing and voice culture) first and second years, two hours a week.

Mathematics, two or four years, four hours a week.

Drawing, four years, four hours a week.

Gymnastics, four years, two hours a week.

Manual training, four years, six hours a week.

Whenever a department, such as mathematics, permits of a choice of subjects, that selection is made which will be serviceable in other work as in solving the problems arising in the machine shop or in the electric appliances. So in English, especially with the more advanced students, much of the composition consists of reports or descriptions about work done in the machine shop, the engine room or the science laboratory.

It must be kept in mind that this course of study is framed to give an all round development to the child, and at the same time prepare for the emergencies and difficulties of actual life. There is no intention of preparing for any special calling, or for any final test or examination. The record of the student's daily work alone determines his advancement.

TEACHERS' COLLEGE, NEW YORK.

As its name indicates this institution is for the training of teachers. It is now a department of Columbia University. Its buildings stand adjacent to those of the University, and its instructors form one of the University faculties.

I wish briefly to refer to its origin as illustrating another phase in the beginning of that movement which is now changing half the educational work and aim of the continent.

Twenty years ago an association of philanthropic people was formed in the city of New York, whose object was to promote the domestic industrial arts among the laboring classes, to diffuse true principles and correct methods of living and to establish a centre of reference and consultation. This association was succeeded in 1884, by one with a broader basis and a larger field of usefulness in view. The new organization was known as the Industrial Educational Association. Its aims were :

To promote special training of both sexes in those industries, which will tend to make those receiving it self-supporting.

To devise and introduce systems of domestic and industrial training into schools.

To form special classes for technical training.

To train teachers who may assist in this work wherever opportunity offers.

The association was eminently successful in its educational work, but a weakness soon developed owing to the lack of trained teachers to carry it on. One of the guiding spirits of the association was President Barnard, of Columbia University ; and largely through his influence the college for the training of teachers was begun in 1887.

Private bequests aided the work, until now there is a splendid building with magnificent equipment, an excellent staff and a school covering all grades of work, from kindergarten through high school subjects. As might be expected in such an institution, the fittings and appliances are the best that can be obtained.

The high school department so nearly resembles that of the Pratt institute in methods and aims that I need not stay to describe it in detail. The arrangement of the curriculum, both for students and for teachers in training, follows the principle that school work should be first and above all educational, that to get the fullest mental discipline out of it for the student, drawing

and manual training should have a due proportion of time and attention with the more strictly academic subjects. It is claimed that such a course, while detracting not at all from the purely educational side, adds a practical and serviceable training for young people who may, and in all likelihood will be compelled to make their own way in the competitive struggle for advancement, and possibly even for existence, under the adverse conditions of modern industrial life.

THE BOARDMAN MANUAL TRAINING SCHOOL, NEW HAVEN.

New Haven is a city of about 100,000 inhabitants, an important shipping port on the sound, and the seat of a large number of important manufacturing industries.

About six years ago a private bequest of \$70,000 for the purpose of establishing a school for the advancement of manual training work, put the city in possession of the institution I am writing about. It has accommodation for 450 scholars, with an attendance of something more than that, and it is almost a certainty that additional room will have to be provided very soon. There is another high school in the city doing language work such as is required for matriculation. As Yale University is in New Haven one would naturally expect that the Boardman school would not be overcrowded, but such is not the case, because the attendance is already beyond the limits of good accommodation, and the signs point to greater increases in the future.

It must not be concluded that because the term "manual training" forms part of the title of the school that all attention is centred in that department. On the contrary, it occupies under most favorable conditions not more than two-fifths of the students' time. The Latin High School and the Manual Training High School are the official titles, and are adopted simply because Latin is a typical study in the preparation for Arts matriculation and the professions, just as Manual Training is a typical subject of the alternate course that prepares for the scientific schools and for engineering and mechanical work.

Latin, English, German, mathematics, history and civil government, botany, physics, chemistry, are all on

the curriculum. In most American high schools students are permitted to select one of several courses and carry it throughout the four years. The plan in the Boardman school is different from this, as there are only two courses,—one, in which Latin is required, prepares for entrance to Sheffield scientific school, the science department of Yale University; the other is the regular technical course of the school which covers English, science, mathematics and manual training.

The practical work for girls parts right at the beginning from that for boys, and later on, in the academic work, girls substitute a modern language for the higher mathematics which the boys require. The manual training for boys in this school is made up as follows:

First year—Freehand and mechanical drawing, benchwork, wood turning, wood carving.

Second year—Drawing, mechanical and freehand, pattern making and moulding in foundry.

Third year—Drawing, as before, forging and sheet metal work.

Fourth year—Drawing, machine shop work.

I was impressed in this school with the excellence of the finished work done by the pupils. In no other school of this grade that I saw is there so much care to have completed articles made by the students. The Principal puts in practice his contentions that an exercise should, so far as possible, be a finished part of some object. Thus the simple process of cutting a thread on a bolt is something more than merely cutting the thread; it is making a necessary portion of a piece of apparatus upon other parts of which a dozen boys may be engaged, and when each has completed his piece all will be assembled and that bolt will help bind all together. This theory is quite opposed to that on which most manual training courses are laid out, and I mention it to show that there is room for individuality in this line of school work as much as in any other.

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I was particularly struck with the facility and the independence which the girls had gained in their special work. In the drawing class, for instance, casts and statues had been sent to the garret, or to ornament the rooms and halls; instead of them, one pupil was selected to mount the platform and occupy a seat on it, then the remaining members of the class set to work with crayon and pencil to make a sketch of the sitter. In another

class of twenty-five girls apparently there were twenty-five different designs being worked out. One was busy with a water color sketch on a fancy cushion cover, one with a stencilled design in colors for a book cover, another with a poster ornamented with a figure and fancy lettering in colors; so round the class every member was busy either upon some article for home ornamentation, or for use in the industrial arts.

The Boston High School of Mechanic Arts.

In Boston the classical courses of the former secondary schools, and the studies that go to make up the education necessary for the citizen and business man long ago parted company, and established themselves respectively in the Latin high school and the English high school. About six years ago the board of education deemed it necessary to make another cleavage, and to establish a school capable of carrying on, to a somewhat advanced stage, the manual training started in the public schools. Thus the Mechanic Arts' high school of Boston had its origin; and I believe that no one questions its position as easily the leader of such institutions in the New England states. I mention this because all the other first-class schools I have described have been founded or aided by private persons. This is entirely a municipal one, administered by the board that controls the other education of the city.

The school has an attendance of 600 boys; apparently there is no similar provision made for girls, but this will doubtless come very soon. The course of study resembles, in subjects, those of the other schools described, but rather more attention is given to the manual training and drawing. These two take up about half the time of the students, the other subjects being mathematics, history and English. The regular course covers three years, but a fourth year's work is optional if students wish to return. The only foreign language is French, and only such training is given as will enable the student to read the language with facility.

Some Observations.

What I have said about the size, equipment, character, and curriculum of the schools described will give some

idea of the degree of efficiency aimed at by those in charge of that class of work, but it does not give any idea of how wide spread this movement has become in the educational machinery of the United States. If one travels from New York to Boston, by the New York, New Haven & Hartford railway he will make a journey of about five hours on a fast train, in other words, the distance is comparable to that from Kingston to Montreal or from Kingston to Toronto. In that five hours trip the traveller will pass through Bridgeport, New Haven, Springfield, Hartford and Worcester, every one of which has a manual training high school with good equipment and staff, doing such work as has been described ; while in the same district he will find The Stevens Institute of Technology at Hoboken, The Sheffield Scientific School at New Haven, The Worcester Polytechnic at Worcester, The Lawrence Scientific School at Cambridge, and The Massachusetts Institute of Technology at Boston, Every one of these is a scientific and engineering school of high standing,—the last mentioned being probably unsurpassed in the world.

Again with Boston as a centre, one finds in that city the Mechanic Arts High School. In Cambridge, to which the traveller goes by street car, is the Rindge Manual Training School. An hour's ride down the coast takes him to Providence, which has a noted manual training school. Half an hour's journey up the coast the other way takes him to Lynne, with another manual training high school. An hour's journey in another direction lands him at Lowell where he will find still another such institute. Another indication of the growth of this class of work in schools is the difficulty of getting qualified teachers. A department of the Pratt Institute is devoted to the training of men and women who desire to take up the teaching of this class of work in the schools. The Teachers' College does similar work, yet at the Pratt Institute I could not find trace of a single person who is available to take up the work we want done in Kingston. At the Teachers' College I heard of one, and in Boston of a second one. In all my enquiries elsewhere, both at schools and in casual interviews with people whom I thought it advisable to ask about the matter, I did not

hear of a single person whom we could get. What did I hear of though was enquiries for qualified teachers for technical work that could not be met.

A second observation which is forced upon one that has much to do with schools, is the general demand for what is called education, for sake of the material advancement which it is hoped will follow. Only a short time ago a year or two in the shop either as an apprentice, or a junior hand, with another year or two's practice as a journeyman was thought sufficient to qualify a tradesman as an expert workman. Now the shifting of manufacturing work from the tradesman's shop to the great factory, from the widely scattered country towns and villages to the centres where power is cheap and shipment convenient, and the replacement of the hand driven tools of the workmen by the steam driven automatic machine of the mill has forced the mechanic to give up his shop, the employer to discharge his hands. Then the mechanic from the shop and the man discharged, who found themselves with trades by which they could not make a living and without the power of adaptation to the new circumstances, turned blindly, clamouring for legislation for themselves, thinking that a government, especially if it be a democratic one can do all things for the individual, and equally blindly calling for education for their children imagining that the thing they call education has magic to bring material prosperity.

I am told that in the American cities, where the stress of industrial competition is so keen, this looking to education as an agency for placing the young in positions of advantage is particularly strong; but this demand requires intelligent guidance and discrimination as to the quality of that education if service is to be rendered to those who seek it. Are we not daily enacting the tragedy of handing a stone to the child who is asking for bread?

A third observation is that this movement in secondary education seems to have originated in private enterprise and by private aid in the United States. Higher institutions, such as the Massachusetts Institute of Technology, were sometimes started and aided by the state, but the grammar schools and high schools seem

to have taken action only after a demand for that kind of education had been created by the establishments due to private generosity.

Another observation is that boys and girls in the American High Schools are better fitted by their training to go out into life than are those whom we send out. This is not due to greater intelligence on the part of either pupils or teachers, but to a more rational and elastic system. There seemed, in every school that I saw, to be a familiarity with the current affairs of life and an originality in thought and plan which we seldom meet with on this side of the line. I watched closely to find the cause of this and concluded that it was mostly due to freedom in the class as regards work. In most of their schools examinations play a very unimportant part, so that I can hardly think of a student under these conditions going to a head master and asking questions, such as I have to answer many times every year. Is geography required for matriculation? If not why should I be forced to study it? The examiners never ask questions in arithmetic about £. S. D. Why should we take up time with them? The III. Book of Caesar is not set down for our exams, next year, so it is just waste of time for us to read it, can we not be let off from it? Our class has only to write on four subjects this year. Can we not drop all the rest of our classes now (15th May) and put our time on these four, so that we will be sure to pass?

In most of the American schools the outside examination has very little influence, the school standing, of which the teachers' certificate is evidence, counts for everything; with us the outside examination is all, the school record is nearly always nothing, and when it does count its influence is so trifling that it is on the whole a negligible quantity. The result is, as in my judgment from what I saw it works out in practice, they do not try to make scholars but to educate, we do not try to educate but to make scholars of sufficient calibre to answer a small percentage of the examiner's questions. I think, therefore, that our students in high schools are not so well equipped as they might be for intelligent progress in life.

I have also to mention the brightness and decoration of the school buildings. Pictures of good quality and not of the chromo type were plentiful, casts and statuettes were in halls and class-rooms, and the whole air and appearance of the rooms were in most cases cheerful, pleasant and agreeable. This was, of course, partly due to the exercises, but largely to the fixtures and surroundings.

Some Conclusions.

1. That the high school course should be made for educational ends, and not with a view to giving mere academic standing, as for teachers' or matriculants' qualifications.

2. It should be made as broad as circumstances will permit, not by allowing wide choice of subjects to students, but by allowing teachers and schools freedom for work within certain limits.

3. In order that the high school may be as widely serviceable as possible at least one course of study should provide such training as will turn the students' minds towards the practical occupations of life as distinguished from the professional.

4. That the student who spends one-quarter to one-third of his time in manual training does not thereby fall behind in his regular classes. The question was asked by me repeatedly, and the answer always was to the effect that students in the high schools, who took manual training were not hindered in their other work by it; and that generally when they went to higher institutions such as schools of technology and scientific departments of universities, they forged ahead of others who went in with equal academic standing, but without workshop practice. The explanation is that time spent at the bench is a relaxation from the regular work of the school and the problems of the shop develop mental activities and originality in overcoming difficulties that help in the classroom, the laboratory or the study quite as much as they do at the bench.

5. Students who have completed a course of study such as that of the manual training schools of American cities meet with much readier employment than do others. This seems to be particularly the case with manufactur-

ing concerns, and large supply houses who require intelligent boys to train up either as expert workmen or as department managers. In two of the schools described I was told that a single large manufacturing firm in each city was prepared to give employment to all the members of the class graduating from the school who chose to enter that line of business. In other cases the report was that the boys from the manual training high school had preference over all others in entering the employ of large manufacturing and commercial firms.

6. A manual training department of a school does not seem in any sense to be a reforming institution. A dull boy in the ordinary classes in language or mathematics may be exceedingly clever in the shop or *vice versa*, but the evidence seems to be that the boy whose home training (for this is always due to the home, not to the school), has made him worthless or vicious, or educationally a degenerate in ordinary work of school, will be equally worthless or vicious or degenerate in all departments. It is regularity, system, order, obedience, that he is rebelling against, quite as much as against work.

7. The teachers whom I asked about the matter were without exception of opinion that students who were in attendance at the manual training departments of the schools took more interest in their work than did the other scholars. For instance, one said to me: "They have to keep order in the class-rooms, but order keeps itself in here." Permission to remain in the shops to work after hours was held out as a privilege which could only be enjoyed by diligent application during regular hours, and this privilege is generally sought.

8. Manual Training taken by itself is no proper school subject. The ability to perform certain operations with tools is of no value whatever educationally, and next to none industrially. It is only when this subject forms a section of a curriculum, carefully correlated in all its parts, that it deserves a place in school. Then the object should be entirely to gain power from the doing,—not to gain the power to do.

9. In that district of the United States which has been mentioned as so thickly dotted with scientific and

technical schools, every village, town and city is humming with the bustle of mill and factory. This, doubtless, has had its effect in causing the establishment and growth of the schools. The account is balanced every year by scores of experts, trained in theory as well as practice, who turn into these same industries and give their knowledge, their experience, their energy to increase the sum of the productive capacities of the country; while hundreds of others from the schools, less mature but with minds trained and faculties alert, and ambition spurring them on to become the leaders in their occupations, are all adding their abilities to increase the ever growing total of industrial output.

More than once it has occurred to me that these cities and towns clustered along the shores of the New England States, with their mills and schools so closely connected, have for us in Ontario a lesson, as to how we might solve the great industrial problem of bringing into proper conditions and relations the raw material of the human factor with its undeveloped capacities and powers and the raw material stored away by nature in mine and forest, in order that they may interact to produce that commercial prosperity and financial success which will ensure the largest and best life for the nation and the individual, with all that best living implies, both materially and intellectually.

Course of Training For Girls.

In the schools which I saw, and from what information I could obtain, there seems to be a well-recognized course of practical instruction for girls as well as for boys. The aim, however, is somewhat different. For the girl the object is to give her the power to at least oversee home duties, such as cooking, cleansing, decorating the home, sewing, millinery and dressmaking, doing simple nursing of sick persons, with enough scientific basis of these various operations to intelligently perform them.

A typical curriculum of girls' work, running through a high school period of four years, would be about as follows:

First year—Freehand drawing, designing of patterns

for fancy needle work and wood carving. Sewing of straight seams both by hand and on a machine. Wood carving.

Second year—Wood carving; millinery, beginning with simple hat trimming, extending to more difficult work. Dressmaking, cutting and making up cotton blouse, skirts, complete dresses of light material. Drawing, designing ornamental patterns for book-covers, posters, etc.

Third year—Making up a costume of heavy cloth. Cooking, preparing simple dishes. Drawing, working in charcoal and colors for ornamentation. Chemistry and physics.

Fourth year—Cooking of meats, fish, bread, etc. Chemistry of cookery, cleansing and disinfecting. Cooking for invalids, physiology of digestion, practical exercises in home nursing, emergency operations in cases of accidents. Dressmaking of jackets, cloaks and hats.

I am strongly of opinion that a course of this kind when carried out efficiently and intelligently must result in very great benefit to the community. Just as I am of opinion that an educational system which compels girls to put their time and energies upon abstract mathematics and the niceties of composition in foreign languages, to the exclusion of this needful and useful knowledge and training, is not rendering proper service either to the nation, the community or the individual. In fact, that it is quite as desirable for the material prosperity of the country that the girls should have training and preparation for household industries and economies, as that the boys should have education specially for their probable duties in life.

I wish to point out before quitting this subject that this course is highly educative as well as affording useful accomplishments. A girl of sixteen or seventeen, who with a tape-line, and using her neighbour as a model, can make the requisite measurements, then from these can draft a dress on paper and cut out her patterns, then cut out a cloth dress and make it up in becoming manner so that it will fit, has had, I submit, an amount of mental exercise that it would be impossible to equal in quality in the class-room, and that it would take many an hour's drill to equal in quantity.

Recommendations to the Board.

1. That in order that the Collegiate Institute may serve the largest purpose as an educational institution, provision be made for a mechanical and scientific course for both boys and girls, but that at present the work be started only with boys, until it is seen what adjustments among the classes this experiment will make possible, and until it is settled whether the requirements of this new class will warrant the board in undertaking such expenditure on a complete outfit of rooms, fittings and machinery as would be wanted for all departments of the work.

In manual training provision should be made at once for shops, benches, lathes and tools for boys (and girls too if thought best) doing a course of exercises in wood-working.

The next step, I think, should be to provide a girls' course in sewing, dressmaking, millinery, cooking, hygiene and home decoration. Lastly provision should be made, if the demand warrants it, for putting in a course of metal work for boys.

According to this plan we will begin next September with a course of study made up of mathematics, science, English and manual training for boys. The manual training consisting of freehand and mechanical drawing, and wood-working at benches and lathes. Girls, if they desire it, might at the same time be accommodated with a course in freehand drawing and wood-carving.

2. That as soon as authorization can be obtained from the Minister of Education for

1. The admission to this course of pupils other than those who have passed the entrance examinations, and whom it may be deemed advisable to permit to attend ;

2. The use of necessary books in these classes other than those authorized :

3. The employment, for this work, of necessary teachers other than those qualified as high school masters under Ontario regulations ;

An announcement containing information regarding the courses of study in the Institute be prepared, printed and distributed.

Conclusion.

I wish also to make acknowledgment of the very great

kindness shown me by those to whom I applied for information and help. The most valuable thing I brought back from my trip is that which it is impossible to put in any report, viz., the impressions and the influence left by contact with men who are the leaders in the great educational movements on the other side of the line. Men whose time was valuable and whose energies were required elsewhere, freely gave me both time and attention in my hunt for information. Mr. Williston, the head of the science and manual training department of Pratt Institute, gave up a whole afternoon to the consideration of the matter of technical education and its effect on the people, and on trade and manufactures. Similarly Mr. Richards of the Teachers' College gave me nearly a whole day, partly in the endeavor to find a teacher, partly in advising as to the course to follow, in dealing with the problem that we have to solve in Ontario. In like manner at East Orange, New Haven and Boston, I found not only courteous treatment, but also careful, considerate attention on the part of the principals and those members of the various staffs whom I had occasion to consult. To me this was particularly gratifying, because I had no reason to expect such favors, and the results, as I have said, are probably the most profitable thing I have here brought back; and if our experiment in manual training and practical education turns out successful, as we all hope for, these gentlemen should have full credit for the help they gave regarding details.

Respectfully submitted.

What Can Be Done.

In the larger cities, Ottawa, Toronto, Hamilton, London, Montreal, Winnipeg, a course of study similar to that outlined in this report at page 15 can very well be introduced into the public schools at the kindergarten stage, and carried to completion in a technical high school, established by the municipality, just as are the present high schools for the language courses. Another solution, and one that is better both from the point of organization and of education, is that in which the whole school from the kindergarten to the machine shop and the nursing room, together with the necessary science, &c.,

would all be arranged in one institution and under one management.

The schools of this class that to-day are doing the best educational work on the continent had their origin in private endowments. There are philanthropic people in Canada who are in a position to aid educational institutions, and who have in many cases liberally done so in the past.

The wide spread benefits, and the possibilities of good to the rising generations that originate in such schools as those here described, make it pertinent to suggest that such an endowment may be quite as philanthropic a matter as the founding of university chairs; and that the greater the number of students who in early years can be provided with a suitable preparatory education, the greater will be the call for university work at a later period and the higher the educational standing of the country.

In the smaller cities and larger towns the elementary part of the course can be carried on in the public schools with the present work; but as the establishment of separate high schools is probably beyond the means financially of these municipalities, a technical course made up of the most necessary part of the curriculum can be introduced into the existing collegiate institutes. For boys this selected course would be kindergarten exercises; drawing, both freehand and mechanical; wood-working exercises and woodcarving. For girls, kindergarten exercises; drawing, freehand and ornamental designing; needlework as far as easy dressmaking and millinery; and simple cooking and nursing operations. In all cases however, the classroom work consisting of English, Science, Mathematics and optional languages (if desired) should be taken without curtailment.

A Restatement.

Finally let me restate what I have said before, for sake of emphasizing it. A technical course to be valuable must have in it the power of mind development as well as of imparting knowledge, and it must be adapted to the temperament and employments of the people and to the needs of the country.

The Manual Training portion of such a course does not offer either time or place for amusement but it should be made up of serious, sober educational work, hence it must have a proper allotment of time among the regular school classes, not at some extra period of recess ; it must have trained teachers for instructors, not mere mechanics ; it must be made up of exercises which lead to some definite result other than that of merely learning how to do.

A technical course including Manual Training for boys and Domestic Science for girls is necessary for the greatest good of the individual, the home and the country ;—for the individual to give a broader field for personal development and to prevent the waste of human ability through want of opportunity for its exercise ; for the home, to give the means of living to the greatest advantage and with the most comfort that the financial and social circumstances of the family will permit ; for the country, to promote its prosperity, to secure a proper development of its resources, and to improve the position of the people both financially and intellectually.

A Final Question.

Have we that system of education which, in design and administration, is best calculated to give our people, as a whole, the largest power of living, by fitting them to take advantage of the great industrial and social revolutions which these latter days are producing ? If we are sure that we have such a system we may of course rest contented with it. If, on the other hand, we are not satisfied, but wish to join in the march of progress which other civilized nations have been making for the last twenty or thirty years, the question arises " How are we to accomplish it ? " This report is offered by way of suggestion.

Respectfully yours,

W. S. ELLIS.

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